RTCA DIGEST

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INSIDE

Portable Electronic Devices
New Challenges and Tasks

Over 60 participants attended the first meeting of RTCA's newest activity, Special Committee 202 – Portable Electronic Devices (PEDs), on May 6-7, 2003 at RTCA. Since the early 1960s, RTCA has studied, with three separate committees, the interference aspects of non-intentional PED emitters and provided timely recommendations to the aviation community and the Federal Aviation Administration concerning their use aboard aircraft.

While this is RTCA's fourth committee to consider PEDs issues, SC-202 tasks are more complex and demanding. Because of the rapidly developing use of PEDs with intentional emitters and the desire of operators, crews and passengers to use wireless technologies onboard aircraft, new regulatory recommendations and standards are expected. In addition to being tasked to define and recommend specific guidance for the acceptable use of PEDs on aircraft, the committee is requested to recommend specific guidance for aircraft design and certification that can mitigate risks identified for PEDs.

SC-202's task is divided into two Phases – a Near Term PEDs Technology Assessment and a Longer Term PEDs Technology Assessment. An early guidance document, for Phase I, will focus on PEDs technologies that currently exist and uses existing technical data as much as possible. The Phase II task will focus on emerging PEDs technologies and address the regulatory and certification issues.

At the first meeting a series of speakers presented a sampling of previous work. Dave Walen, FAA, presented a summary of previous RTCA PEDs committees and their recommendations; Michel Crokaert, Airbus, presented a summary of the EUROCAE WG-58 evaluation work; Bill Sears, ATA, presented a summary of regulatory action on PEDs to date; Jay Ely, NASA Langley, presented a summary of NASA's research performed to quantify PEDs electro-magnetic interference (EMI) on aircraft; Jeff Schiffer, Intel, presented a summary of PEDs testing in the 2.4GHz band; and Kent Horton, Delta Air Lines, presented a summary of Delta's research on radio frequency pathloss and aircraft susceptibility.

The committee formed four Working Groups to address the issues of the Phase I objectives. WG-1, PEDs Characterization, will organize PEDs into categories and classes including definition of transmit power levels, modulation type and frequency of operation. WG-2, Aircraft Pathloss, will address the pathloss characteristics of potential sources of electrical interface on aircraft. WG-3, Aircraft Susceptibility, will provide an updated summary of the susceptibility of a variety of aircraft to EMI. WG-4, Risk Assessment, will support multiple efforts and coordinate writing the initial document. The committee set January 2004 to complete Phase I. Phase II completion is planned for October 2005.

SC-202 is Co-Chaired by Dave Carson, Boeing Commercial Airplanes and Bill Winfrey, Delta Air Lines. We would be pleased to learn of your plans to participate in this important new initiative. SC-202's next meeting is scheduled for July 22-24, 2003 at RTCA.

Program Management Committee

The Program Management Committee (PMC) approved four new documents at its meeting on April 10, 2003. The new documents are listed on page 8 of the *Digest*.

Additional issues discussed:

- New Special Committee 202. The PMC reviewed their earlier approval via electronic coordination of SC-202, Portable Electronic Devices. See *Digest* front page.
- Special Committee 199

  SC-199's Terms of Reference have been completed. The PMC retired the committee.
- Electronic Flight Bag (EFB) Activity.

  The PMC received an update on SC-181's activity to complete a revised DO-257, *Minimum Operational Performance Standards for the Depiction of Navigation Information on Electronic Maps*. SC-181 is incorporating comments received during the Final Review and Comment (FRAC) process and will coordinate the post-edited document with SC-181 members prior to forwarding to the PMC. A small exploratory PMC group was approved to define EFB and determine if other alternatives for developing EFB guidance should be pursued.

The next PMC meeting is planned for June 25, 2003.

Chairman: Bill Jeffers, ARINC
Secretary:
Harold Moses, RTCA, Inc.

RTCA Welcomes New Members

Advanced Technical Group, Inc.
Advanced Technical Group specializes in design engineering and test equipment and has engineering experience on TCAS, RADAR, and ComNav equipment. The company currently has a TCAS ADS-B tester under development. Representative: Mr. Jorge Rivero.

Ground Telecommunications Equipment Systems Program Office
The Ground Telecommunications Equipment Systems Program Office supports all ground based aviation systems for the Australian Department of Defense. Representative: Mr. Peter Hetherington.

Hauts Monts Inc.
Hauts Monts, Inc. specializes in aerial photography. The company has developed supporting programs that permit optimization of aero triangulation analytics, cartography, and numerical imagery. Representative: Mr. Philip Lacoste

Product Creation Studio
Product Creation Studio is a designer of accessory products for the general aviation pilot. Representative: Mr. Scott Thielman

Team Cormorant
Team Cormorant provides marketing and promotion services for European aviation products in Canada. Representative: Mr. Gabriel Galleazzi

Veracity Engineering
Veracity Engineering's aviation projects currently include runway incursion prevention, runway status lights, and ground vehicle tracking. Representative: Mr. Hai Tran

Finding a Data Link Path

Amr A. ElSawy
Senior Vice President, MITRE
General Manager, MITRE/CAASD

The RTCA *National Airspace System (NAS) Concept of Operations* embodies the community vision of a system that maximizes the use of airspace and airport resources while enabling users to optimize their own operations within constraints. This vision depends on a data rich environment that allows people, wherever they are, to have the information and underlying decision support tools needed to make the right decisions. As part of this vision, air traffic management operations increasingly build upon aircraft capabilities.

In this way of doing business, air-ground exchange of information is vital. In every view of the future for aviation, Data Link is a key enabler for functions such as 4-D route negotiation, automatic dependent surveillance, or delivery of weather and constraint information to the cockpit. The Data Link service that we usually think of, Controller Pilot Data Link Communications (CPDLC), has been operational in oceanic airspace and is now at Miami Center as well as in Maastricht.

The commitment of the community for making Data Link a reality has been demonstrated so far with some notable investments. In Miami, the FAA has deployed CPDLC automation and trained its facility. American Airlines has 20 aircraft equipped so far (with more on the way). ARINC has invested in ensuring that their new VDL-M2 network is compatible with the Aeronautical Telecommunication Network (ATN), vendors such as Rockwell Collins and Teledyne are offering CPDLC and ATN systems, and several airlines are about to join the CPDLC community – notably Continental, Delta, and Federal Express.

The challenge for us as a community is to determine how to move from these *pathfinder* projects to a plan that will deliver the envisioned data link benefits. In this economic environment, decision processes have become more stringent to ensure that investments in people and systems truly provide a payback. With the deferment of national implementation of CPDLC, now is our opportunity to lay out an affordable path to meet the overall goal of integrating functions among traffic flow management, air traffic control, and the flight deck. Getting there will require synchronized investments by the user community and the government. For the FAA, it means adding data link capabilities in an incremental path that provides a growing set of benefits for users and the system. For industry, it means increased growth in equipage levels to ensure sufficient benefits and operational efficiencies.

Another challenge facing the community is to develop a roadmap for the communications infrastructure that provides the right mix of technologies to deliver air/ground data and voice services. To move forward, we need to understand tradeoffs amongst the different options that lay before us. With the projected traffic levels, the voice systems will have sufficient capacity to last another ten to fifteen years. A robust data link for ATC will allow us to transform the way we use the system and enable new operations and procedures that can increase safety and capacity. Lack of agreement on a future path for data link, will translate into lack of progress for aviation.

Recommendation for Future Air-Ground Communication for the VHF Aeronautical Band (SC-172)

The forty-fifth meeting of SC-172 was held April 8-10, 2003, at RTCA.

WG-2 continues to develop the draft of DO-224B, *Signal-in-Space MASPS for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques*, planned for completion in March 2005. The "B" update will consolidate material from DO-224A, Changes 1 and 2, and add material relevant to VDL Mode 3. Working paper topics for this session included:

- VDL Mode 3 Polling Schedule Algorithm (revised)
- Voice Services (proposed MASPS section)
- VDL Mode 3 Data Burst Example
- Audio Level Requirements for VDL Mode 3 Vocoder
- Multiple Radio Installations
- MASPS/MOPS changes to address Multiple VHF Digital Radio Installations

WG-3 is developing Change 1 to DO-271A, *MOPS for Aircraft VDL Mode 3 Transceiver Operating in the frequency Range 117.975 – 137.000 MHz.* The Plenary discussed the need to capture critical known requirements for use in the FAA's Technical Standard Order process. Completion of the change is expected in the third quarter of 2003. The work of the group was guided by papers that included:

- Comments from EUROCAE.
- Exclusion Band for Environmental Testing of RF Susceptibility
- Proposed MOPS Changes to Ad dress Multiple Radio Installations with potential changes in three categories; equipment classes, test set configurations, and test procedures.

NEXCOM. Bruce Eckstein and Andy Colon reported members from Japan had attended a NEXCOM Demonstration at FAA WJHTC in November 2002. The FAA Demonstration 2003 is in planning with participation by three avionics radio vendors. FAA's new IPT NEXCOM Lead is Bill McGovern.

EUROCAE WG47. Keith Hanneman reported EUROCAE is resolving comments for their document ED-92, *MOPS for an Airborne VDL Mode-2 Tansceiver Operating in the Frequency Range 118.000 – 136.975 MHz.* This document was coordinated with SC-172 but not created jointly.

The next SC172 Plenary and Working Group Sessions will be at RTCA on June 10, 11 2003.

Chairman:
Bill Stine, NBAA
Program Director:
Rudy Ruana, RTCA

NEXCOM Implementation (SC-198)

The Seventeenth meeting of SC-198 took place at RTCA on April 29, 2003 and focused on two core issues:

- Resolution of comments received during the Final Review and Comment (FRAC) process for Change 1 to DO-284, *Next Generation Air/Ground Communication System (NEXCOM) Safety and Performance Requirements (SPR)*
- Clarifying integrity questions posed by PMC members in approving DO-284

The SC-198 Plenary resolved the FRAC comments on Change 1 to DO-284 and approved the change to be forwarded to the Program Management Committee (PMC) for approval consideration. Members of WG-5 met to consider the integrity questions. The SC-198 plenary approved WG-5's proposals for incorporation in Change 1.

The PMC will consider two SC-198 deliverables at its meeting on June 25th:

- Change 1 to DO-284
- Draft Document, *NEXCOM Plan, U.S. National Airspace System (NAS) Plan for Transition to Air/Ground ICAO VDL Mode 3 Based Integrated Voice and Data Communications.* This document was approved for forwarding to the PMC at an earlier SC-198 Plenary held on March 25th.

Pending document approvals and other decisions by the PMC on June 25th, SC-198's work program has been completed.

Chairman:
Karl Grundmann, NASA
Program Director:
Rudy Ruana, RTCA

Global Positioning System (SC-159)

The Sixty-First meeting of SC-159 was held on May 19th at RTCA. No new documents were presented for approval. Capt. Perz, USAF – GPS JPO, provided a briefing on the GPS constellation currently consisting of 28 operating satellites. GPS Block IIR and Block IIF satellites will modernize signals. Eight Block IIR satellites are in orbit and the next launch is scheduled for July 29th. The first GPS III satellite launch is planned for the end of the decade although the schedule could be more aggressive and is under review. GPS III requirements include increased accuracy, precision timing, integrity enhancements and enhanced signal levels.

WG-1, 3rd Civil Frequency, discussed L5 acquisition issues and signal performance. The update to DO-261, L5 Signal Specification, will await solidification of ICD-GPS-705 and may include New and Improved Ephemeris (NICE) information. In joint session with WG-2, plans for a draft WAAS L1/L5 ICD/ Signal Specification by September 2003 were set. WG-1 will develop the signal specification and WG-2 will complete the data messages and message scheduling.

WG-2, GPS/WAAS, reviewed the current status of the WAAS program. IOC commissioning is scheduled for July 10, 2003. The IOC will service 95% of the U.S. and portions of Alaska with minimums down to 350 feet. FOC, expected in 2006, will service the full continental U.S and most of Alaska with minimums down to 250 feet. Over 700 LNAV/ VNAV procedures are expected to be available at WAAS commissioning.

WG-2C, GPS/Inertial, continued ionosphere modeling analysis of the International Reference Ionosphere model and the Parametrized Ionosphere Model and planned for a Ionospheric Storm Model development. A proposal was considered to develop a TSO based on DO-229C – Appendix R. The WG agreed to continue integrity coasting work and performance documentation before developing a TSO.

WG-4, GPS/LAAS, reported that the FAA awarded Phase 1 of the LAAS contract for the hardware and software design of the LAAS Cat. I system. IOC is projected for September 2006. If Phase 2 is exercised initial systems would be installed in Chicago, Houston, Juneau, Memphis, Phoenix and Seattle. To support a decision point for the LAAS Cat. II/III program, WG-4 is aggressively working to update the LAAS MASPS and ICD by June 2004. Terminal Approach Path (TAP) work is underway to add system requirements to support segmented and curved GLS procedures to the LAAS MASPS and ICD.

WG-5, Airport Surface Navigation and Surveillance, completed a draft report entitled *Evaluation of Category I LAAS to Support Airport Surface Operation.* The assessment concluded that Cat. I LAAS is capable of supporting defined airport surface operations down to visibility condition 3.

WG-6, GPS/Interference, continued work on the L5 RFI Assessment Report. Drafts of most chapters are complete. The basis is GPS L5 receiver (no WAAS) plus E5a (based on EUROCAE inputs) in a combined receiver. Environmental sources of interference and values are being finalized.

Next meeting: September 15-19, 2003

Chair: Larry Chesto, Consultant
Vice Chair: George Ligler, PMEI
Program Director:
Harold Moses, RTCA, Inc.

Digest Acronyms

ACS	Access Control Systems	JPO	Joint Program Office
ATN	Aeronatuical Telecommunications Network	LAAS	Local Area Augmentation System
CPDLC	Controller Pilot Data Link Communications	LNAV	Lateral Navigation
EFB	Electronic Flight Bag		
EMI	Electro-Magnetic Interference	NEXCOM	Next Generation Air/Ground Communications
ERAM	En Route Automation Modernization	NICE	New and Improved Ephemeris Information
EUROCAE	European Organization for Civil Aviation Equipment	PEDs	Portable Electronic Devices
FANS	Future Air Navigation System	PMC	Program Management Committee
FOC	Full Operational Capability	RFI	Radio Frequency Interference
GPS	Global Positioning System	VDL	Very High Frequency Digital Link
ICD	Interface Control Document	VNAV	Vertical Navigation
IOC	Initial Operational Capability	WAAS	Wide Area Augmentation System

Free Flight Steering Committee (FFSC)

The Free Flight Steering Committee met May 8, 2003 at the FAA Headquarters in Washington D.C. Steve Brown, Associate Administrator for Air Traffic Services and Designated Federal Official for the Free Flight Steering Committee, introduced the Steering Committee's new Chairman, Don Barber of Federal Express, and new Vice Chairman, Russ Chew of American Airlines. Mr. Brown also recognized the committee's former Chairman, Robert Baker of American Airlines, for his long, dedicated service to the Free Flight Steering Committee and the aviation community.

Roger Wall, Chairman of the Free Flight Select Committee, reviewed the Select Committee working group structure and reported on activity and recommendations for three working groups.

- Safe Flight 21
  Portions of the Safe Flight 21 program have matured and the focus has shifted from assessments and analyses to more implementation-related issues. Aircraft equipage is happening in "pockets" in Alaska, Kentucky, Arizona, and Florida. The Select Committee recommends that implementation should occur where benefits are achieved and those receiving benefits are willing to invest.
- Airspace Working Group
  The original March 2003 implementation of the National Airspace Redesign has been extended over the balance of calendar year 2003 to address avionics, procedural, planning and operational issues. Two levels of service are planned to accommodate differences in aircraft database capabilities. Milestones in 2003 for implementing phase 1 of the High Altitude Redesign have been established.
- CPDLC Working Group
  The work of this group included two areas – FANS-1/A accommodation in domestic CPDLC en route airspace and recommendations for domestic CPDLC. The working group determined that FANS-1/A accommodation was technically feasible but that requirements, costs, schedules, and resource commitments are undefined. The working group recommended that FANS-1/A accommodation not be pursued at this time. With regard to domestic CPDLC an approximate two-year window exists prior to 2008 during which CPDLC could be added to eight centers with no apparent adverse impact to the En Route Automation Modernization (ERAM) schedule. The Select Committee recommended that FAA and industry continue to work together to move domestic CPDLC forward and further the implementation of ATC datalink in the U.S.

Mike Gough, Deputy Director of the Free Flight Program Office, presented an update on Free Flight Phase 2. The FY 2003 appropriation for FFP2 is currently $79.5 million. The use of the Traffic Management Advisor tool has shown positive operational results at Atlanta, Fort Worth, Los Angeles and the Southern California TRACON. The future of CPDLC Build 1A is currently in executive review.

The Free Flight Steering Committee will next meet on August 20, 2003.

Aeronautical Operational Control (AOC) Message Hazard Mitigation, (AMHM) (SC-201)

The fourth plenary session was held April 15-17, 2003 at the Federal Express training facility in Memphis.

The structure of the draft document, *Safety and Performance Requirements Standard for AOC Data Link Services*, was revised from five sections to four. The newly structured sections will include discussions of the following topics:

- Section 2 – Aeronautical Operations Control (AOC) Data Link Services
- Section 3 – Guidelines for Application of AOC Data Link Services
- Section 4 – Affected AOC Data Link Services

The SC-201 Plenary created a consolidated draft. The document is on schedule for completion in September 2004.

The next plenary meeting is scheduled for July 8-10, 2003 at RTCA, Washington, DC.

Chairman:
Frank Longo, Continental Airlines

Program Director:
Rudy Ruana, RTCA

RTCA TRAINING PROGRAM

- DO-278, *Guidelines for Communications, Navigation, Surveillance, and Air Traffic Management (CNS/ATM) Systems Software Integrity Assurance*
- DO-248B, *Final Annual Report For Clarification of DO-178B*
- DO-178B, *Software Considerations in Airborne Systems and Equipment Certification*

Courses are tailored to the expected experience of the students.

Certification Services, Inc. provides the training at
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Class hours are 9:00 AM to 5:00 PM with an hour for lunch

MANAGERS COURSE **July 15, 2003** **October 21, 2003**	A one-day course that provides a sound understanding of why and how aviation-related software must be certified, system certification considerations, the content and application of DO-178B and related guidance. **Registration: $ 695 – RTCA Members / $ 795 – Non-Member Rate**
PRACTITIONERS COURSE **July 16-18, 2003** **October 22-24, 2003**	A three-day course that includes some elements of the Managers program but focuses on the details of DO-178B concepts, rationale and applications. **Registration: $ 1,295 – RTCA Members / $ 1,495 – Non-Member Rate**
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Title	
E-mail Address	
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Mailing Address	
Credit Card # Company and Expiration Date	

Register for training online at www.rtca.org or use this form.
Contact Rudy Ruana with questions at rruana@rtca.org, phone (202) 833-9339
FAX (202) 833-9434.

NEW DOCUMENTS AVAILABLE

DO-286, *Minimum Aviation System Performance Standards (MASPS) for Traffic Information Service - Broadcast (TIS-B)*

Issued 4-10-03 Prepared by SC-186

This document reflects consideration of existing capabilities available to support initial applications using TIS-B, as well as the requirements for future systems necessary to support advance applications. This version of the TIS-B MASPS is intended to support only the Enhanced Visual Acquisition and the Airport Surface Situational Awareness applications. Later versions will support additional applications and services, and will define a Multi-link Gateway.

DO-285, *Next Generation Air/Ground Communications (NEXCOM) VDL Mode 3 Interoperability*

Issued 4-10-03 Prepared by SC-198

This document provides the interoperability requirements for Air Traffic Services (ATS) supported by NEXCOM VDL Mode 3. It presents technical and functional requirements that provide the basis for ensuring compatibility among the various elements of the Communications Navigation Surveillance/Air Traffic Management (CNS/ATM) system using digital voice and data services.

DO-260A, *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B)*

Issued 4-10-03 Prepared by SC-186

This document supercedes RTCA DO-260, *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast (ADS-B)*, published in September 2000. DO-260A is published in two volumes.

The major changes incorporated in this document include:

- Enhanced reception techniques;
- 1090 MHz support for Traffic Information Service – Broadcast (TIS-B);
- Changes for the ADS-B MASPS (DO-242A) including the separation of accuracy and integrity values of the broadcast data, reorganization of the ADS-B reports, and changes as to how intent information is broadcast; and
- Open issues from original 1090 MHz development.

DO-230A, *Standards for Airport Security Access Control Systems*

Issued 4-10-03 Prepared by SC-199

This document updates RTCA DO-230, *Standards for Airport Security Access Control Systems*, published in March 1996.

Using the original DO-230 format, the document has been expanded into the following sections:

- Section 1 introduces the Access Control Systems (ACS), purpose, scope, goals, and operational requirements.
- Section 2 provides guidance for system performance.
- Section 3 addresses subsystem performance of access media and hardware.
- Section 4 provides guidance for system verification and validation.

The document contains three appendices that provide guidance and reference material:

- Appendix A provides detailed guidance on biometrics and smart card technologies.
- Appendix B provides reference examples of sample reports commonly found in ACS.
- Appendix C provides a list of acronyms and abbreviations used in the document.

Calendar of Events

June

2	SC-181/WG-1	6	SC-181/Plenary
2	SC-181/WG-4	10	SC-194/Plenary
3	SC-181/WG-1	10-12	SC-172/Plenary
3	SC-181/WG-4	9-13	SC-193/WG-44
4	SC-181/WG-1	17-19	SC-159/WG-6
4	SC-181/WG-4	23-27	SC-189/WG-33@ Honeywell
5	SC-181/WG-1	24	RTCA Spring Forum
5	SC-181/WG-4	25	PMC
3,4,5	SC-195		

July

8-10	SC-201
15	DO-178B Training Managers Course
16-18	DO-178B Training Practitioners Course
16-17	SC-172 Plenary
22-24	SC-159/WG-6
29-31	SC-197